

WHAT IS CLAIMED IS:

1. A supporting system, comprising:  
a carrying member for carrying thereon a  
workpiece; and  
5 a supporting mechanism having a magnet, for  
supporting a weight of said carrying member;  
wherein a supporting force to be provided by  
said magnet does not change with a shift of said  
carrying member along a plane perpendicular to a  
10 direction in which the weight is supported.
2. A supporting system according to Claim 1,  
wherein said supporting mechanism has a magnet and a  
magnetic member, and wherein said magnet and said  
15 magnetic member differ from each other in respect to a  
size in a direction perpendicular to a direction in  
which a force operates between said magnet and said  
magnetic member.
- 20 3. A supporting system according to Claim 1,  
wherein said supporting mechanism includes plural  
magnets for mutually operating a force, wherein one  
magnet differs from another magnet in respect to a  
size in a direction perpendicular to a direction in  
25 which a force operates between the magnets.
4. A supporting system according to Claim 1,

wherein said supporting mechanism includes a magnetic member and an electromagnet, wherein said magnetic member and said electromagnet differ from each other in respect to a size in a direction perpendicular to a direction in which a force operates between said magnetic member and said electromagnet.

5        5.     A supporting system according to Claim 4, wherein each of said magnetic member and said electromagnet comprises a layered structure of thin magnetic material plates.

10       6.     A supporting system according to Claim 4, further comprising a controller for controlling an electric current to said electromagnet.

15       7.     A supporting system according to Claim 6, further comprising a detector for detecting a clearance between said electromagnet and said magnetic member, and a circuit for feedback of a signal related to the detected clearance to an electric current to be applied to said electromagnet.

20       8.     A supporting system according to Claim 1, further comprising a position controller for positioning said carrying member, wherein plural supporting mechanism are disposed so as not to produce

a moment to said position controller.

9. A supporting system, comprising:

5 a carrying member for carrying thereon a  
workpiece; and

a supporting mechanism for supporting said  
carrying member, said supporting mechanism having a  
first element for producing a resisting force to a  
shift in a supporting direction, and a second element  
10 for producing a force for increasing the shift in the  
supporting direction;

wherein said second element can produce a  
force for moving said carrying member downwardly.

15 10. A supporting system according to Claim 9,  
wherein said supporting mechanism includes a spring  
element and a magnet element.

20 11. A supporting system according to Claim 10,  
wherein, adjacent a workpiece processing position for  
the workpiece, a weight of said carrying member and a  
combined force of said first and second elements are  
substantially equal to each other.

25 12. A supporting system, comprising:

a carrying member for carrying a workpiece  
thereon; and

a supporting mechanism for supporting said  
carrying member from a workpiece transfer position to  
a workpiece processing position, said supporting  
mechanism having a first element for producing a  
5 resisting force to a shift in a supporting direction,  
and a second element for producing a force to increase  
a shift in the supporting direction.

13. A supporting system according to Claim 12,  
10 wherein said second element for producing a force to  
increase the shift produces a force to move said  
carrying member downwardly.

14. A supporting system according to Claim 12,  
15 wherein, adjacent to the workpiece processing  
position, the weight of said carrying member and a  
combined force of said first and second elements are  
approximately equal to each other.

20 15. A supporting system according to Claim 12,  
wherein the force to be produced by said second  
element is larger at the transfer position than at the  
workpiece processing position.

25 16. A supporting system according to Claim 12,  
wherein said first and second elements include a  
spring element and a magnet element.

17. A supporting system, comprising:

a carrying member for carrying a workpiece thereon; and

5 a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position, said supporting mechanism having a spring element and a magnet element;

10 wherein, adjacent the workpiece processing position, the weight of said carrying member and a combined force of said spring element and said magnet element are approximately equal to each other, and wherein said magnet element has a magnet with a  
15 clearance which is smaller at the transfer position than at the workpiece processing position.

18. A supporting system according to Claim 17, wherein, at a certain position, the clearance of the  
20 magnet of said magnet element is smaller than that at the workpiece processing position, and at that position, the weight of said carrying member and the combined force of said spring element and said magnet element are approximately equal to each other.

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19. A supporting system according to Claim 17, wherein an absolute value of a changing rate of the

force of said magnet element with respect to a change  
in clearance of the magnet, adjacent the workpiece  
processing position, is set smaller than an absolute  
value of a changing rate of the force of said spring  
5 element with respect to a change in the clearance of  
the magnet.

20. A supporting system, comprising:  
a carrying member for carrying a workpiece  
10 thereon; and  
a supporting mechanism for supporting said  
carrying member from a workpiece transfer position to  
a workpiece processing position, said supporting  
mechanism having a spring element and a magnet  
15 element;  
wherein, adjacent the workpiece processing  
position, the weight of said carrying member and a  
combined force of said spring element and said magnet  
element are approximately equal to each other, and  
20 wherein said magnet element has a magnet with a  
clearance which is larger at the transfer position  
than at the workpiece processing position.

21. A supporting system according to Claim 20,  
25 wherein, at a certain position, the clearance of the  
magnet of said magnet element is larger than that at  
the workpiece processing position, and at that

position, the weight of said carrying member and the combined force of said spring element and said magnet element are approximately equal to each other.

5           22. A supporting system according to Claim 20,  
wherein an absolute value of a changing rate of the  
force of said magnet element with respect to a change  
in clearance of the magnet, adjacent the workpiece  
processing position, is set larger than an absolute  
10 value of a changing rate of the force of said spring  
element with respect to a change in the clearance of  
the magnet.

          23. A supporting system, comprising:  
15           a carrying member for carrying a workpiece  
thereon; and  
          a supporting mechanism for supporting said  
carrying member from a workpiece transfer position to  
a workpiece processing position, said supporting  
20 mechanism having a spring element and a magnet  
element;

          wherein an absolute value of a changing rate  
of the force of said magnet element with respect to a  
change in clearance of the magnet, adjacent the  
25 workpiece processing position, is set smaller than an  
absolute value of a changing rate of the force of said  
spring element with respect to a change in the

clearance of the magnet.

24. A supporting system, comprising:

5 a carrying member for carrying a workpiece  
thereon; and

a supporting mechanism for supporting said  
carrying member from a workpiece transfer position to  
a workpiece processing position, said supporting  
mechanism having a spring element and a magnet  
10 element;

wherein an absolute value of a changing rate  
of the force of said magnet element with respect to a  
change in clearance of the magnet, adjacent the  
workpiece processing position, is set larger than an  
15 absolute value of a changing rate of the force of said  
spring element with respect to a change in the  
clearance of the magnet.

25. A supporting system, comprising:

20 a carrying member for carrying a workpiece  
thereon; and

a supporting mechanism for supporting said  
carrying member from a workpiece transfer position to  
a workpiece processing position;

25 wherein, adjacent the transfer position, the  
weight of said carrying member and a force to be  
applied to said carrying member are substantially



balanced, and wherein, adjacent the workpiece  
processing position, the weight of said carrying  
member and a force to be applied to said carrying  
member are substantially balanced.

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26. A supporting system according to Claim 25,  
wherein said supporting mechanism has a first element  
for producing a resisting force to a shift in a  
supporting direction, and a second element for  
10 producing a force for increasing the shift in the  
supporting direction.

27. A supporting mechanism according to Claim 25,  
wherein said supporting mechanism includes a spring  
15 element and a magnet element.

28. An exposure apparatus, comprising:  
a carrying member for carrying thereon a  
workpiece; and  
20 a supporting mechanism having a magnet, for  
supporting a weight of said carrying member;  
wherein a force to be applied to said magnet  
does not change with a shift of said carrying member  
along a plane perpendicular to a direction in which  
25 the weight is supported.

29. An exposure apparatus, comprising:

a carrying member for carrying thereon a  
workpiece; and

a supporting mechanism for supporting said  
carrying member, said supporting mechanism having an  
5 element for producing a force to increase/decrease a  
shift in a supporting direction, wherein, as the shift  
in the supporting direction increases, said carrying  
member is moved downwardly.

10 30. An exposure apparatus, comprising:

a carrying member for carrying a workpiece  
thereon; and

a supporting mechanism for supporting said  
carrying member from a workpiece transfer position to  
15 a workpiece processing position, said supporting  
mechanism having a first element for producing a  
resisting force to a shift in a supporting direction,  
and a second element for producing a force to increase  
a shift in the supporting direction.

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31. An exposure apparatus, comprising:

a carrying member for carrying a workpiece  
thereon; and

a supporting mechanism for supporting said  
25 carrying member from a workpiece transfer position to  
a workpiece processing position, said supporting  
mechanism having a spring element and a magnet

element;

wherein, adjacent the workpiece processing position, the weight of said carrying member and a combined force of said spring element and said magnet element are approximately equal to each other, and wherein said magnet element has a magnet with a clearance which is smaller at the transfer position than at the workpiece processing position.

10        32. An exposure apparatus, comprising:

a carrying member for carrying a workpiece thereon; and

15        a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position, said supporting mechanism having a spring element and a magnet element;

20        wherein, adjacent the workpiece processing position, the weight of said carrying member and a combined force of said spring element and said magnet element are approximately equal to each other, and wherein said magnet element has a magnet with a clearance which is larger at the transfer position than at the workpiece processing position.

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33. An exposure apparatus, comprising:

a carrying member for carrying a workpiece

thereon; and

a supporting mechanism for supporting said  
carrying member from a workpiece transfer position to  
a workpiece processing position, said supporting  
5 mechanism having a spring element and a magnet  
element;

wherein an absolute value of a changing rate  
of the force of said magnet element with respect to a  
change in clearance of the magnet, adjacent the  
10 workpiece processing position, is set smaller than an  
absolute value of a changing rate of the force of said  
spring element with respect to a change in the  
clearance of the magnet.

15 34. An exposure apparatus, comprising:

a carrying member for carrying a workpiece  
thereon; and

a supporting mechanism for supporting said  
carrying member from a workpiece transfer position to  
20 a workpiece processing position, said supporting  
mechanism having a spring element and a magnet  
element;

wherein an absolute value of a changing rate  
of the force of said magnet element with respect to a  
25 change in clearance of the magnet, adjacent the  
workpiece processing position, is set larger than an  
absolute value of a changing rate of the force of said

spring element with respect to a change in the clearance of the magnet.

35. An exposure apparatus, comprising:

5           a carrying member for carrying a workpiece thereon; and

          a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position;

10           wherein, adjacent the transfer position, the weight of said carrying member and a force to be applied to said carrying member are substantially balanced, and wherein, adjacent the workpiece processing position, the weight of said carrying member and a force to be applied to said carrying member are substantially balanced.

36. A device manufacturing method, comprising the steps of:

20           preparing an exposure apparatus as recited in any one of Claims 28 - 35;

          applying a resist to a wafer;

          exposing the wafer by use of the exposure apparatus; and

25           developing the exposed wafer.